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January 8, 1975

Dr. Joshua Lederberg
Department of Genetics
Stanford University School of Medicine
Stanford, California 94305

Dear Josh:

Cal Ward must be referring to a Special Topics Course on RNA and DNA regulation in bacteria I taught in the Spring of 1969, as my farewell to Molecular Genetics just before taking my Neurobiological orders at Harvard Medical School. I am afraid my memory is very hazy and I am not sure I have my notes any longer. I am sure I didn't give any empirical data on maximal growth rates.

What I think I did was to calculate the maximum rate of r-RNA synthesis per DNA genome, assuming that all the r-RNA cistrons are densely packed with RNA polymerase molecules, and using the RNA chain growth step time we had then recently measured in vivo. If this maximum rate is q, then at a rate of DNA synthesis r per genome, the maximum ratio of RNA/DNA is q/r. Now using Maaløe's empirical linear relation between [RNA/DNA] content of bacteria and r (where r is inversely related to the generation time via the genome size) you can find the value of r where q/r lies on the Maaløe line. That value of r gives you some kind of theoretical minimum generation time (if one assumes, as is nearly true, that the RNA chain growth rate is invariant).

I am sorry that this is the best I can do "at this point in time". I would suggest that you contact Ole in this matter, who had been my guiding beacon in the first place. Meanwhile, I send you my warmest regards

Your

Günther S. Stent

GSS:mh